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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/607,043	06/26/2003	Edward L. Sughure II	34035US	6408

7590 04/07/2006

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EXAMINER

GRIFFIN, WALTER DEAN

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 04/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/607,043	SUGHURE ET AL.	
	Examiner	Art Unit	
	Walter D. Griffin	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 March 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6,8-17,19-21,24-31 and 33-65 is/are pending in the application.
- 4a) Of the above claim(s) 50-65 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6,8-17,19-21,24-31 and 33-49 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 13, 2006 has been entered.

### ***Response to Amendment***

The rejection of claim 21 under 35 USC 112, second paragraph, as described in the Office Action of September 8, 2005 has been withdrawn in view of the amendment filed on March 13, 2006.

### ***Election/Restrictions***

Claims 50-65 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on July 22, 2005.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-6, 8-12, 14-17, 19-21, 24-31, and 33-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Russ et al. (US 5,366,614) in view of Sughrue et al. (US 6,254,766 B1).

The Russ reference discloses a process for desulfurizing a hydrocarbon such as cracked gasoline. The process comprises contacting a hydrocarbon feedstock in a reforming zone with a particulate system comprising a physical mixture of a reforming catalyst and a sulfur sorbent. The mass ratio of catalyst to sorbent can range from 1:10 to 10:1. This combination of catalyst and sorbent would necessarily desulfurize the hydrocarbon while improving the octane of the

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hydrocarbon. Since reforming includes isomerization and cracking reactions, the catalyst would necessarily be effective, to some extent, for isomerization and cracking. The reforming catalyst comprises a platinum group metal and a support such as a zeolite. Specific zeolites include those identified as FAU and MFI. The zeolite type identified as MFI includes ZSM-5 zeolites. These zeolites may be in the hydrogen form and necessarily comprise rings of T atoms and have channel dimensionality as claimed. Operating conditions include temperatures from 260° to 560°C (500° to 1040°F). The catalyst/sorbent mixture can be regenerated and reactivated while other reactors remain on-stream. This discloses simultaneous desulfurization and regeneration and this regeneration would necessarily remove sulfur and coke from the particles. See column 1, lines 39-55; column 3, lines 27-34 and 52-68; column 5, lines 1, 2, and 66-68; column 6, lines 1-68; column 7, lines 1-15 and 43-64; column 9, lines 25-68; column 10, lines 1, 2, and 61-68; and column 11, lines 1-10.

The Russ reference does not disclose the oxidation and reducing steps to regenerate and reactivate the particulate system, does not disclose a zinc oxide and promoter metal sorbent, does not disclose the amount of or silica-alumina ratio of the zeolite in the catalyst, does not disclose the mean particle size range, and does not disclose that the particles have a Group A Geldart characterization.

The Sughrue reference discloses a desulfurization sorbent that comprises zinc oxide (10-90 wt%), alumina, silica, and nickel (5-50 wt%). Since alumina is present in the sorbent, an aluminate would necessarily be present. A substitutional solid solution as claimed would also be formed. The sorbent is regenerated by oxidation followed by reduction as claimed. The oxidation is performed at temperatures ranging from 800° to 1200°F and the reduction is performed at

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temperatures ranging from 100° to 1500°F. The sorbent has particle sizes in the range of 20 to 500 microns. See column 2, lines 59-65; column 4, lines 8 through column 6, line 26; and column 8, line 46 through column 9, line 36.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Russ by utilizing the sorbent of Sughrue in place of the sorbent disclosed by Russ because the sorbent is effective at desulfurizing the feed streams of Russ with minimal effect on the octane of the feed stream. One would necessarily use the regeneration and reactivation procedure that is effective for the sorbent of Sughrue.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Russ by utilizing any amount of zeolite and utilizing a zeolite having the claimed silica:alumina ratio because one would adjust the amounts in order to maximize the production of the desired product and because any zeolite that falls within the classes of zeolites disclosed would be expected to be effective in the process regardless of the silica:alumina ratio of the zeolite.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Russ by utilizing particles with the claimed size and Group A Geldart characterization because as long as there is effective contact, one would utilize any type of particles in relation to size and Group A Geldart characterization.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Russ et al. (US 5,366,614) in view of Sughrue et al. (US 6,254,766 B1) as applied to claim 7 above, and further in view of Dodwell (US 6,429,170).

The previously discussed references do not disclose the use of perlite in the sorbent.

The Dodwell reference discloses a sorbent that comprises zinc oxide, silica, alumina, and a promoter metal. The silica is in the form of perlite. See column 3, lines 6-24.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the teachings of the previously discussed references by including perlite in the sorbent of Sughrue as the silica source as suggested by Dodwell because the sorbent life and attrition value of the sorbent can then be controlled.

### ***Response to Arguments***

The argument that there is no motivation to combine the Sughrue reference and/or the Dodwell reference with the Russ reference because the Sughrue and Dodwell references use feeds with larger amounts of sulfur as compared to the Russ reference is not persuasive. The fact that the sorbents of Sughrue and Dodwell are effective in feeds containing larger amounts of sulfur does not mean nor would it suggest that the sorbents are not effective in feeds containing sulfur amounts as disclosed by Russ. A sulfur sorbent would be expected to remove to least some sulfur from a feed regardless of the initial amount of sulfur in the feed.

The argument that the examiner is applying an improper obvious to try rationale is not persuasive. The examiner asserts that, for reasons of record, it is obvious to do the modifications described above.

The argument that the Russ reference does not disclose oxidation and reduction steps and does not disclose simultaneous steps of desulfurization, regeneration, and reduction is not persuasive. The Russ reference discloses continuous regeneration of catalyst. Therefore, the examiner asserts that the Russ reference teaches simultaneous desulfurization and regeneration.

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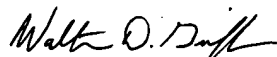
Since the rejection is based on a combination of references, the examiner maintains that because Sughrue discloses reduction, the combination of references would suggest simultaneous desulfurization, regeneration, and reduction.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter D. Griffin whose telephone number is (571) 272-1447. The examiner can normally be reached on M-F 6:30 to 4:00 with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Walter D. Griffin  
Primary Examiner  
Art Unit 1764

WG  
April 5, 2006